ASSESSING THE SUITABILITY OF THE BONE ANALYSIS PLUG-IN OF ORS DRAGONFLY FOR BONE MICROSTRUCTURE ANALYSIS

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Bone constitutes a suitable research object due to compatibility with computer tomography (CT) based methods. By creating virtual representations of a specimen, scientific oriented imaging software offers the possibility to process and further investigate them. The Python-based imaging software ORS Dragonfly developed a bone analysis plug-in, suitable for both recent and fossil bone material. Through segmentation and the subsequent calculation of different bone parameters, the plug-in makes an internal examination of bone structures possible. During the analysis of intraspecific variations in the humeri of the European red squirrel (*Sciurus vulgaris fuscoater*), the suitability of the Dragonfly bone analysis plug-in for this type of research was tested and evaluated. The starting point of the study were image stacks, acquired and reconstructed from raw projection data scanned with the CoreTOM (microCT). Subsequently the image stacks were read into Dragonfly with a voxel size of 0.026 mm and analysed according to the defined steps of the plug-in. Problems encountered during analysis occurred mostly in the segmentation step and definition of the Regions of Interests (ROIs). Due to the organic residues in the bone, positioning of the bone during scanning as well as growth stage dependent variation, segmentation was often insufficient and had to be corrected manually, in a very time-consuming manner. A macro was programmed to minimize the problems, although manual correction was still necessary to an extent. In conclusion, Dragonfly poses as a very competent software for analysing internal bone structure. More focus, however, could be put into the recognition of the heterogeneous morphology of bones and compatibility with high numbers of samples. Furthermore, the programme might be well suited for the investigation of fossil bone material, but it cannot be excluded that similar segmentation problems might arise due to the condition of the fossilized bone as well as inorganic residue.